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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
08/930,449	10/07/1997	HIROYUKI ABE	JAO-39514	3024

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EXAMINER

RAO, SHRINIVAS H

ART UNIT	PAPER NUMBER
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2814

DATE MAILED: 03/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

08/930,449

Applicant(s)

ABE ET AL.

Examiner

Steven H. Rao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4 to 63 is/are pending in the application.
- 4a) Of the above claim(s) 19, 24, 29, 44, 45, 50-55 and 34-39 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-18, 20-23, 25-28, 30-33, 35-38, 40-43, 46-49 and 56-63 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- ☐ Interview Summary (PTO-413) Paper No(s) _____
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other:

Response to Amendment

Applicants' amendment filed on December 12, 2002 and supplemental amendment filed on January 31, 2003 have been entered on January 07, 2003 and February 25, 2003 respectively.

Therefore claims 1,12,20,25,30,35,40,46 and 56 as amended by the amendments of 12/12/02 and 01/31/03 and claims 4 to 11, 13 –18,21-23,26-28,31-33, 36-38, 41-43, 47-49 and 63 as previously recited are currently pending in the application.

Claims 19,24,29,34,39,44,45 and 50-55 have been previously withdrawn from consideration.

Election/Restrictions

This application contains claims 19,24,29,34,39,44,45 and 50-55 drawn to an invention nonelected with traverse in Paper No.6. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1,2,4-18,21-23,25-28,30-33 and 35 –38 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one

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skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

All independent claims (namely 1,12,20,25,30,35,40,46 and 56) all have been amended to recite, " crystallized by cooling solidification under a hydrogen-containing atmosphere of at least atmospheric pressure" and , " wherein unpaired bonding electrons on the surface of the thin film during the cooling solidification are terminated by hydrogen atoms in the hydrogen atoms in the hydrogen-containing atmosphere of at least atmospheric pressure. "

Applicants' cite specification page 13 lines 28 to 30 in support of the above and it is noted that Applicants' specification pages 13 lines 24 to 33 states, " ...Therefore, the partial pressure of melt crystallization of all hydrides (including hydrogen molecules), which safely achieves the object of the invention is 10 mTorr to 5 Torr.

Although the partial pressure of the hydride used in the second step is preferably atmospheric pressure or higher. Of course, melt crystallization under low pressure(vacuum) which satisfies the above partial pressure conditions produces the same effect as described above."

Therefore the specification describes a two step process (in which hydrate including hydrogen molecules) a first step wherein hydrogen molecules are introduced over the thin film at a partial pressure between 10mTorr and 5 Torr. In the second step the total pressure (i.e. the partial pressure of hydrate including hydrogen molecules at a partial pressure between 10mTorr and 5 Torr) plus the pressure in the system apparatus is equal to the atmospheric pressure

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or higher. Therefore Applicants' recitation of, "by hydrogen atoms in the hydrogen atoms in the hydrogen-containing atmosphere of at least atmospheric pressure" is not supported by the specification which describes a two step process wherein during the first step as shown above the partial pressure of Hydrogen (or hydride) alone is only between 10 mTorr to 5 Torr and not an atmosphere or more as recited. Further in second step the pressure may be atmospheric pressure or more. Applicants' present recitation does not recite the two separate steps with two different pressures but recites the first implantation step with the pressure of the second step.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2, 4-18, 21-23,25-28,30-33 and 35-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cathey et al. (U.S. Patent No. 5,329,207 herein after Cathey) and Nakamura (U.S. Patent No. 5,200,630, herein after Nakamura) both previously applied.

With respect to claims 1,12, 20, 25, 30 35 and 40 in addition to the teachings previously stated (and incorporated here by reference for the sake of brevity), the presently recited additional steps :

Crystallizing at least a surface layer of the thin film by applying energy to a window that exhibits transparency to the energy to the surface of the thin film, wherein a distance between the window and the thin film is more than about twenty mm, and at least the surface layer of the thin film is melted by the applied energy and crystallized by cooling solidification under a hydrogen- containing atmosphere of at least atmospheric pressure (Nakamura col. 4 lines 59-64 reproduced below and Cathey Fig. 3 D col.5 lines 63-65)

Thereafter, hydrogen plasma is generated between the electrodes 55 and 56 and laser beams having a wavelength of 308 nm are irradiated onto the amorphous silicon 53 through the window 52 by the XeCl excimer laser 59 such that the amorphous silicon 53 is crystallized into polycrystalline silicon. Typical conditions for

Therefore for the laser to pass through the window and reach (react) with silicon the window has to exhibit transparency to the energy. (XeCl excimer laser).

Wherein a distance between the window and the thin film is more than about 20mm . . Nakamura as stated in the Office Action mailed on March 11, 2002 at least page 7 etc. describes the positioning (distance) between window and film , therefore without a showing of criticality or unexpected results obtained by the distance of 20mm it is obvious to have a distance of 20mm because it was previously done in the overlapping range as taught by Nakamura. Further

the distance of 20nm is merely selection/discovery of an optimum value of result effective variable is a known process within the skill of the art. In re Boesh 205 USPQ 215 (CCPA) and In re Aller where general conditions of a claim are disclosed in the prior art, discovering the optimum or work able ranges involves only routine skill in the art.

It is further noted that Applicants' specification pages 13 lines 24 to 33 states, " ...Therefore, the partial pressure of melt crystallization of all hydrides (including hydrogen molecules), which safely achieves the object of the invention is 10 mTorr to 5 Torr.

Although the partial pressure of the hydride used in the second step is preferably atmospheric pressure or higher. Of course, melt crystallization under low pressure(vacuum) which satisfies the above partial pressure conditions produces the same effect as described above."

Therefore according to Applicants' specification describes crystallization is safely achieved between 10mTorr to 5 Torr and an overlapping range namely 0.1 to 1.0 Torr is also disclosed by the applied Nakamura reference in col. 4 line 66.

Further the applied primary reference Cathey discloses the melt crystallization process at least in col. 6 lines 26, and therefore the combination of the applied references (motivation to combine already stated previously and incorporated here by reference) discloses an overlapping hydride partial pressure and the second step of melt crystallization under low pressure which according to Applicants' specification satisfies the above partial pressure conditions and produces the same effect as described above.

Dependant claims 2, 4-11,13-18, 21-23,26-28,31-33 and 36-38 were alleged to be allowable because they depend upon allegedly allowable independent claims 1,12, 20, 25, 30 35 and 40.

However as shown above independent claims 1,12, 20, 25, 30 35 and 40 are not allowable therefore dependant claims 2, 4-11,13-18, 21-23,26-28,31-33 and 36-38 are also not allowable and are rejected for reasons previously set out and those stated herein.

B. Claims 40-43,46-49 and 56-63 are rejected under 35 U.S. C. 103 (a) as being unpatentable over Cathey et al. (U.S. Patent No. 5,329,207 herein after Cathey) and Nakamura (U.S. Patent No. 5,200,630 herein after Nakamura) and further in view of Japanese Patent No. 58-90722 (herein after Japanese patent"722) for the reasons previously set out (and incorporated by reference for the sake of brevity) and those stated below (in response to Applicants' arguments section).

Therefore all outstanding claims under consideration have been rejected for reasons previously set out and those stated herein.

Response to Arguments

Applicant's arguments filed 7/22/02 have been fully considered but they are not persuasive for the following reasons:

It is noted that Applicants' throughout their amendment are dealing with references individually i.e. piecemeal analysis of the references, it has been held

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that one cannot show non obviousness by attacking references individually where, as here, the rejections are based on the combination of references . In re Keller, 2087 USPQ 871 (CCPA 1981).

Applicants' arguments that the applied reference does not disclose ,teach or suggest the steps of , "Crystallizing at least a surface layer of the thin film by applying energy to a window that exhibits transparency to the energy to the surface of the thin film, wherein a distance between the window and the thin film is more than about twenty mm, and at least the surface layer of the thin film is melted by the applied energy and crystallized by cooling solidification under a hydrogen- containing atmosphere of at least atmospheric pressure ' is not persuasive because as shown above the combination of the prior art references when read in light of the Applicants' admitted Prior Art as stated in the specification shows very clearly that all of the presently recited limitations are meet by the applied references.

The motivation for combining Cathey, Nakamura and Japanese Patent NO. 59-90722 is clearly set out on page 2 last two lines to page 11 lines 1-9 of the O/A mailed 11/17/1999 and page 11 of the O/A mailed 3/11/2002.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven H. Rao whose telephone number is (703) 3065945. The examiner can normally be reached on 8.00 to 5.00.

The fax phone numbers for the organization where this application or proceeding is assigned are (703) 7463926 for regular communications and (703) 872-9319 for After Final communications.

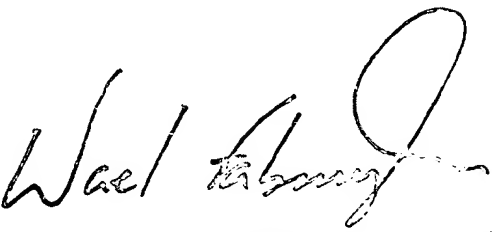
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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 3067722.

Steven H. Rao

Patent Examiner

March 3, 2003.


SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2500